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UNECE Convention on Long-range Transboundary Air Pollution

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TFEIP comments concerning possible impacts on future emissions reporting associated with implementation of potential flexibility mechanisms under a revised Gothenburg Protocol

Dear Mr Ballaman,

The TFEIP is of course following with interest the significant on-going work being undertaken by various bodies under the LRTAP Convention to contribute to the revision of the Gothenburg Protocol, and in particular we note the current draft text of the revised Protocol (ECE/EB.AIR/WG.5/2011/1) tabled for discussion at the forthcoming April 2011 meeting of the WGSR.

As the chairs of the TFEIP, we would like to take this opportunity to welcome several particular proposed additions in the current draft, which we feel will significantly strengthen the quality of data available for the future work of the Convention:

- Article 3.11 bis – the enabling clause making mandatory the use of methodologies specified in Reporting Guidelines for Parties within the geographic scope of EMEP;
- Article 7.1(b)iii – the clause requiring Parties to also submit an Informative Inventory Report (IIR) which will ensure there is an increased transparency concerning the submitted emission data. One possible addition that the WGSR may wish to consider is the inclusion of an additional enabling clause requiring that such reports be prepared in accordance with a standard IIR template as agreed by the EMEP SB. In the present Reporting Guidelines, a recommended template is provided, but due to the lack of an enabling clause in the Protocol text its use cannot be made mandatory. This recommendation is based upon past feedback from review experts participating in the annual detailed emission inventory review process (ECE.EB.AIR.GE.1.2007.16), from which it is clear that any analysis is much facilitated by receiving the accompanying information from Parties in a standard format.

In the 2011 work plan of the EMEP Steering Body to the Cooperative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe (ECE/EB.AIR/106/Add.2), it was also agreed that the TFEIP should, as appropriate, provide support to the Gothenburg Protocol revision, including “in particular proposing technical guidance on how emission inventories may be developed and reported to the Convention to reflect a possible flexibility mechanism in assessing national totals against ceilings”.

We thus have been closely following the work being led by the WGSR specifically on considering the possible inclusion of flexibility mechanisms into the revised Protocol, and including the informal document tabled by the EU at WGSR47.

We recognise that there have been a number of other possible mechanisms discussed in a variety of fora (including for example under the Task Force on Integrated Assessment Modelling), and we have been considering the potential impacts of associated with trading, swapping and other mechanisms generally. However, in the assessment presented here, we have restricted ourselves to commenting only on the practical aspects from a reporting perspective of those flexibility mechanisms which are included as potential additions in the current draft text of the revised Gothenburg Protocol.

Informal feedback received from inventory compilers generally shows a strong preference for the use of relative emission ceilings for all pollutants in order to most simply address issues associated with the future identification of new sources, or significant changes to emission factors. The option of following a similar approach to that adopted under the UNFCCC Kyoto protocol has also been raised, whereby baseline emissions are fixed at a future time close to the compliance date (2-3 years before). Ceilings could then be based on a percentage increase/reduction on baseline inventories. It also allows for improvements to occur in the science and completeness of emission inventories over the years prior to the formal setting of the base year, but then provides Parties with certainty in terms of the absolute reduction commitment needed. Recognising however that consideration of such issues lies outside the mandate of the TFEIP, we have encouraged that views on this issue are raised through the national representatives in the appropriate Convention bodies (e.g. WGSR). The Kyoto approach simplifies the reporting burden on Parties that would result from reporting an inventory for compliance purposes, and another inventory based on best science.

The TFEIP will be meeting in May, during which the attached paper will be further discussed. We would be pleased to further elaborate the paper to assist the work of the WGSR if this would be helpful.

We hope that you find this assessment of value in your discussions regarding the revision of the Gothenburg Protocol.

Best regards,

Chris Dore, Martin Adams, Kristina Saarinen.
TFEIP Co-Chairs

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1 Introduction

1.1 Background and Context

The 1999 Gothenburg Protocol aims to reduce acidification, eutrophication and ground level ozone by setting absolute emissions ceilings for 2010 for sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds and ammonia. These ceilings were negotiated on the basis of the extent of the environmental impacts of air quality issues in different locations, and the cost effectiveness of options to reduce emissions¹.

Work is currently underway to revise the Gothenburg Protocol, and this is expected to include more stringent emission ceilings for these four pollutants, and introduce an emission limit/ceiling for particulate matter.

Recent developments in emission trends have highlighted the possible need for emission ceilings and/or the assessment of compliance to incorporate a degree of flexibility to account for issues which may not be reasonably predicted at the time obligations are defined, or which may be beyond the control of individual Parties.

1.2 Scope of Assessment

In the current negotiations concerning the revision of the Gothenburg Protocol, it has been proposed that some form of flexibility to future emission ceilings might be introduced in order to reduce, or remove, the impact of such occurrences. At the same time, we would note that the introduction of flexibility mechanisms should not be seen to be providing “loopholes” or allowing too lenient an approach to compliance, or inadvertently encourage Parties to delay mitigating significant sources of emissions.

This paper considers the main flexibility mechanisms presented in the current draft text of the Gothenburg Protocol (ECE/EB.AIR/WG.5/2011/1), and identifies potential impacts on the reporting of emissions and associated practicalities that might arise from their inclusion.

The mechanisms described are:

1. Article 3.1 (Option 2)- the option of introducing a percentage emission reduction target for particulate matter;

and, for Parties having an annual emission in year 2020 above the corresponding emission ceiling to be set in Annex II:

2. Article 3.1 bis.(a) –Parties will be deemed in compliance if the average of the annual emissions for the years 2019-2021 does not exceed that emission ceiling; and

Where the exceedance is caused by:

3. Article 3.1 bis.(b i) – new source categories found after the adoption of the Protocol, and approved by the EMEP Steering Body

¹ http://www.unece.org/env/lrtap/multi_h1.htm

4. Article 3.1 bis.(b ii) significant differences between the emission factors and the way emissions of a source are calculated, the setting of the emission ceilings and the updated emission factors and the way emissions are calculated in assessing emission inventories as approved by the EMEP Steering Body'

2 Relative Emission Ceilings

For particulate matter, two possible approaches to defining emission limits or ceilings are presented in the draft protocol text – an approach based on an absolute ceiling (i.e. Article 3.1 Option 1), or an emission limit based on a 'relative ceiling' concept whereby a required percentage reduction (or increase) from a base year is defined (i.e. Article 3.1 Option 2). We note that relative ceilings (i.e. percentage reduction targets) are not a flexibility mechanism per se, but do have the potential to address similar issues to the flexibility mechanisms outlined in later sections.

Overview

The use of relative emission ceilings, rather than absolute ceilings, means that a percentage reduction on a base year must be achieved by the target year.

If a new (i.e. previously unrecognised) source of particulate matter emissions was added to the inventory, it would then be likely to have a relatively small impact on a Party's progress towards compliance. This is because most new sources would be expected to impact on both the emissions in the base year as well as the emission in the target year, and therefore have little impact on the overall percentage reduction.²

If inventory developments resulted in changes to methodologies or emission factors, then the impact would depend on the details of the revision. The majority of revisions are considered to have no or very little impact on the overall progress towards compliance, but some could make compliance more difficult for the Party.

Finally, as an aside, we note that the Kyoto Protocol to the UN Framework Convention on Climate Change applied a 'middle' approach to providing flexibility in this area (i.e. an option sitting between the absolute and relative ceiling approaches). The Kyoto Protocol was agreed upon with defined percentage reduction targets set for 'Annex I' Parties. In brief – several years later, base-year emissions (in tonnes) were formally agreed for each Party, to which the defined percentage reduction was then applied to determine the absolute emission reduction required over the duration of the so-called 'Kyoto period'. This approach thus has the de facto result of converting a percentage reduction target into an absolute target. It also allows for improvements to occur in the science and completeness of emission inventories over the years prior to the formal setting of the base year, but then provides Parties with certainty in terms of the absolute reduction commitment needed.

Implementation

Implementing percentage reduction targets, as opposed to continuing with absolute emission targets (as proposed for the existing four pollutants regulated under the Gothenburg Protocol), is considered to require no additional effort in terms of inventory compilation activities.

² More precisely, if the new source was reducing at the same rate as the overall existing inventory, then there would be no net impact. If the new source was constant with time then there would be a negative impact on the progress towards compliance, but this is typically very small. In contrast, a significant new source of emissions that did not occur in the base year would make compliance considerably more challenging, unless emissions from this source were discounted (see separate section concerning 'new sources').

Reporting and Review

The reporting process for emission datasets would remain unchanged, and therefore there should be no additional burden on Parties or the EMEP Centre on Emission Inventories and Projections (CEIP) in terms of their subsequent compilation and assessment of reported emissions data. Parties of course could add a table to their Informative Inventory Reports (IIRs) to indicate percentage reductions to date, and therefore track progress to targets.

The annual detailed (Stage 3) emission review process, performed in accordance with the methods and procedures for review (ECE.EB.AIR.GE.1.2007.16) should consider the emissions reported for both the base year and the target year. At present the review teams do assess time series consistency across all years of submitted data, but with a focus on data from the most recent year. Therefore the effort needed for this would be broadly in line with the levels of effort for the existing Stage 3 review process.

3 The Impact on Reporting of the Proposed Compliance Flexibility Mechanisms

Three possible provisions for assessing compliance are provided in the draft Protocol text for situations in which Parties have an annual emission in year 2020 above the corresponding Annex II emission ceiling (and are detailed in Section 1.2 above).

These mechanisms aim to address issues arising from emissions inventory development and the progression of science in the emissions technical area between the base and compliance years. Where a change (typically either the introduction of a completely new source, or the revision of an existing source) gives rise to a substantial increase in emissions, the proposed mechanisms aim to essentially take into account a correction between an inventory version that may be used for compliance and a version that is based on the best science and suited for air quality modelling and assessment work under the Convention.

In assessing the proposed flexibility mechanisms, several different aspects have been considered and these are indicated below. The focus is very much on the practicalities and effort required from the emission inventory perspective for implementation and operation of the mechanism.

The extent of additional effort required by the Party

How much additional work would be required by the Party's inventory compilers?

For example, are two versions of inventory calculations required (with original and current methodologies)?

Impacts on reporting and review

Is additional guidance material on the mechanism required?

Does the mechanism require changes to the current Guidelines and/or reporting templates?

Does the mechanism require additional work for CEIP?

Does the mechanism impact on the effort needed for the annual emission inventory review process?³

³ The current detailed Stage 3 review process is not intended for compliance checking. The results of the review process can of course be used to inform the subsequent assessment of compliance by the Convention's Compliance Committee.

Practicalities of running the mechanism

Does the mechanism require a Party to actively request that specific issues are taken into account?
How much additional effort would be needed to consider these issues?

Items such as perceived clarity for the lay person, discouraging continuous improvement, or the extent to which a mechanism might make compliance easier for a Party, are considered strategic issues for WGSR to decide upon. They are therefore not included in this assessment.

3.1 Compliance Based Upon an Average of Emissions for 2019-2021

Overview

This proposed mechanism allows a Party to have their compliance with the 2020 ceilings assessed on the basis of a three-year average 2019-2021. The use of such a mechanism reduces the impact of one-off events that might increase the emissions in a single year (such as exceptional emissions from an industrial source, or a particularly cold winter).

Implementation

This option is considered very simple to implement. Little explanatory text would be needed to include this in the relevant papers associated with reporting to the Protocol, and there would be no significant additional burden on Parties. However, the use of 2019-2021 would mean that Parties using this mechanism would only be able to achieve compliance a year later than those not using the mechanism, which may cause a degree of inconvenience in terms of disseminating information to the public.

Reporting and Review

Very little change would be needed to the current reporting practices. An additional table could be included in IIRs to explain where Parties chose to take up this mechanism, and it would be sensible to encourage the reporting of contextual information.

There would be no changes to reported datasets, and therefore no additional burden on CEIP.

The current Stage 3 review process does consider all reported years, however there is a particular focus on the most current year in the time series. The review process required here would be undertaken in the compliance year, for Parties drawing on this mechanism, and would need to consider the emissions estimates for the most recent three years in more detail. This would bring about a small increased burden relative to the existing Stage 3 review process, but in only in the year when compliance is reviewed.

3.2 Consideration of New Source Categories

Overview

Under this mechanism the EMEP Steering Body would decide which “new sources” could effectively be discounted from a Party’s inventory, to correct best science emissions estimates, to a dataset for compliance purposes.

Implementation

This approach to implementation does provide an efficient and transparent way of addressing new sources that arise through emissions inventory development. However, to allow Parties to assess

whether they were on course for compliance, the EMEP Steering Body would need to provide information on their position regarding “new sources” as they arose, and not defer this until the compliance year.

Additional effort would be needed at the EMEP level to consider “new sources” and formally communicate information regarding whether it could be discounted from exceeding inventories or not.

In addition, the term “new source” requires a precise definition before any technical guidance can be drawn up. Examples of a possible definition include:

- Sources which do not have a methodology in the current EMEP/EEA Emissions Inventory Guidebook at the commencement of the Protocol.
- Sources which are not included in the current GAINS model when used to determine ceilings.
- Sources not included in a national inventory when the emission ceilings were determined.

There may therefore be benefit in already a further discussion and guidance from WGSR prior to agreement of a revised protocol text to provide further clarity to Parties (and the EMEP SB) on how the proposed wording around these flexibility options should be interpreted in the future.

For example, Parties are presently recommended to use the methodologies provided in the EMEP/EEA Emissions Inventory Guidebook. **However, the EMEP/EEA Guidebook does not presently provide a complete description of known emission sources (and nor is it designed to do so).** Rather its purpose is to provide a description of ‘default’ methodologies for those sources where the underpinning science is considered sound enough to recommend a consistent European methodology. Many Parties thus already report emissions for more detailed emission sources and activities than are included in the current Guidebook.

Based upon recent scientific studies, the TFEIP is presently reviewing a new and potentially significant source of NMVOC emissions occurring from agricultural sources. If a methodology is in the future included in the EMEP/EEA Guidebook, it may for example lead to significantly higher NMVOC emissions being reported by Parties. This source is also not in the current GAINS version. However, as already we scientifically know (as of 2011) of the potentially significant emissions from this source, would this still be considered by WGSR to be a ‘new source’?

The GAINS model used to calculate emission ceilings is similarly not complete in terms of including all known sources of emissions. Nor are the source categories in the GAINS as necessarily detailed as those in the EMEP/EEA Guidebook (although of course all main emission categories are included in the model). Would a ‘new source’ therefore be considered by WGSR to simply be any source that was not in the version of the GAINS model used to inform the setting of the revised protocol ceilings?

As earlier noted, certain Parties have nationally-specific information available to allow them to provide emission estimates for detailed emission sources. It is considered good practice to do so. In contrast, other Parties may not yet include such sources in their current emission sources, or consider such activities to presently occur in their country. If for the latter Party an estimate is made in the future, or activities are found to occur requiring an estimate be made, would such sources be considered ‘new’ in context of the current text proposal?

From the technical perspective, it is also not clear as to whether the current draft wording means that the mechanism refers to only information on new sources considered by the EMEP SB, or indeed potentially any new source that is included by a Party.

Following clarification of the term “new sources”, some adjustments would be needed to the way in which version control of the Guidebook is conducted (i.e. if a ‘best science’ and a second ‘compliance’ version of the Guidebook need to be maintained separately). This should not however require much of an additional increase in resources required from the TFEIP – for whom the focus would remain on developing and improving a ‘best-science’ Guidebook version.

Reporting and Review

The reporting of a separate inventory for compliance purposes would need the EMEP SB to define the sources for each pollutant that would be included in the inventory (if relevant in the country).

The existing templates for data reporting could be adapted in a simple way to allow the reporting of both a ‘best science’ and ‘emission totals for compliance purposes’ (i.e. an emission total that excludes the agreed “new sources”) in the same template. This would be done by requiring the reporting of best science emission inventories but including one additional line for “compliance corrections”, which might be a positive or negative number. Entries in compliance corrections would require explanatory text, and referencing to the IIR. In this way best science and compliance emission totals can be easily presented, and there would be little extra burden on CEIP.

However, explanations for all sources included in the inventory, including the new sources, and their inclusion or exclusion from the emissions inventory would need to be clearly explained in the IIR. This would require additional work by the national compilers, and potentially impacts on transparency.

The review process would need to investigate the calculations and reasoning behind any “compliance correction” values. The level of additional work required compared to the current review process would depend on the number of new sources identified.

3.3 Consideration of “Significant Changes” to EFs

Overview

Under this Mechanism, the EMEP Steering Body would decide where the impact on emission estimates caused by “significant changes” to emission factors could be addressed for compliance purposes.

This mechanism is expected to be able to address the impact of large changes in emission estimates caused by inventory developments, and not numerous small changes.

Implementation

This is a welcome option that does provide an efficient and transparent way of addressing the impacts of emissions inventory development. To allow Parties to assess whether they were on course for compliance, the EMEP Steering Body would need to provide guidance on issues as they arose, and not defer this until the compliance year.

Additional effort would be needed at the EMEP level to consider the resulting impacts of inventory developments. Where considered appropriate, the EMEP Steering Body assisted by TFEIP would need to draft and publish guidance on methodologies that could be used for compliance purposes, and how these differed from the best science methodologies. In some circumstances the guidance

may be as simple as indicating the use of specific emission factors. However, it should be recognised that some situations may arise where it would be necessary for the guidance to be rather more detailed. This would not only require more effort at the EMEP level, but also potentially more work by the Party's, and during the review process.

In this regard, the term "significant changes in emission factors" would benefit from a more precise definition, although it is difficult to see how this could be done in a simple way. For example changes could be screened using a percentage threshold, but this would vary across the Parties.

Changes would need to be made to the current version control management of the EMEP/EEA Emissions inventory Guidebook. This would ensure that methodologies acceptable for both best science and compliance purposes were clearly presented. This would result in a small increase to the effort required to maintain the Guidebook.

It is important to note that revisions to emission factors can also result in decreases to emission estimates. The current draft text for the Gothenburg Protocol indicates that this flexibility mechanism is solely intended to assist compliance where a Party exceeds its emissions ceiling. So it is presumed that Parties will simply incorporate changes that revise down their best science emission estimates. This does therefore introduce a potential consistency and possibly a public perception issue, in that the proposed flexibility mechanism does provide rather a one-way benefit for Parties – they will not be penalised by significant upward changes in emission factors, but are free to benefit from downward changes (without an corresponding reduction of the ceiling for example).

Reporting and Review

For reporting data, a similar approach to that indicated in Section 3.2 above could be used, whereby minor changes are made to the existing reporting templates, meaning little extra burden on CEIP.

Details of compliance corrections would need to be reported in the IIRs. However, there could be a substantial increase in the amount of work required for compiling IIRs, as they would need to not only explain two methodologies and emission estimates for the same source, but also retain a high level of transparency.

The introduction of best science and compliance methods for the same source could also give rise to a not insignificant additional burden on the review teams undertaking the review process.

4 Conclusions

The mechanisms assessed in this paper have a variety of advantages and disadvantages, and a short summary is provided on each below:

Relative Emission Ceilings for particulate matter

- Absorbs many, but not all, impacts of future inventory development and improvement
- Very simple to implement
- No significant addition to the workloads for CEIP or the emission inventory review teams (compared to the current Stage 3 review process)

Average of 2019-2021 Emissions:

- Simple to implement with no significant additional burden on Parties
- Simple to report, however Parties using this option would achieve compliance a year later than other Parties.
- The emission inventory review process would be slightly more involved than the existing Stage 3 review, but for one year only.

Consideration of New Source Categories

- Efficient way of mitigating impacts of unforeseen changes;
- Precise definition of “new sources” required, but potentially straightforward if clear guidance is provided;
- Only small burden increases for EMEP SB and CEIP;
- A simple mechanism may be introduced in the reporting template to allow reporting of both ‘best science’ estimates and a ‘compliance’ total, however there will be a potentially significant increase in the burden for Parties associated with compiling an IIR. This may also lead to increased effort needed by the review teams.

Consideration of Significant Changes to Emission Factors

- Efficient way of mitigating impacts of unforeseen changes;
- Difficult to define “significant changes” and therefore breadth of the mechanism;
- Burden increase for EMEP SB and TFEIP could be non-trivial, and the additional work required to maintain the EMEP/EEA Emissions Inventory Guidebook could be substantial.
- It is expected that there would be a substantial increase in the burden for Parties associated with reporting methodologies in IIRs. This gives rise to additional work for the review teams;
- Simple mechanism for reporting both best science estimates and a compliance total.

Combining Flexibility Mechanisms

Consideration has also been given to whether there are any complications associated with combining the three flexibility mechanisms presented above.

The simplicity of the Three Year Average mechanism means that it can be easily combined with the flexibility mechanisms associated with new sources and significant changes to emission factors.

It has been suggested that relative emission ceilings could be used for particulate matter. New sources or significant changes to emission factors have the potential to work in favour or against progress to compliance. For example a new source impacting on just the base year improves percentage reductions, one impacting on just the target year does not. So it may be that Parties are somewhat selective in the new sources or emission factor revision that they choose to take into account and this means that a list of sources which are considered for a compliance review needs to be defined and agreed upon by the EMEP SB.